System N

Computing Processors

Memory with Local Caches

System 2

Computing Processors

Memory with Local Caches

System 1

Computing Processors

Memory with Local Caches

Coupling Facility

External Time Reference

Dynamic Switch

DASD Subsystems

Fig. 1
(PRIOR ART)

File Locking Mode

2-Level Locking

1-Level Locking

Tran or Batch

Batch

Tran

Obtain CA Lock in BATCH_EXCLUSIVE state

Obtain CA Lock in TRANSACTION_SHARE state

Obtain Record Lock in SHARE or EXCLUSIVE state
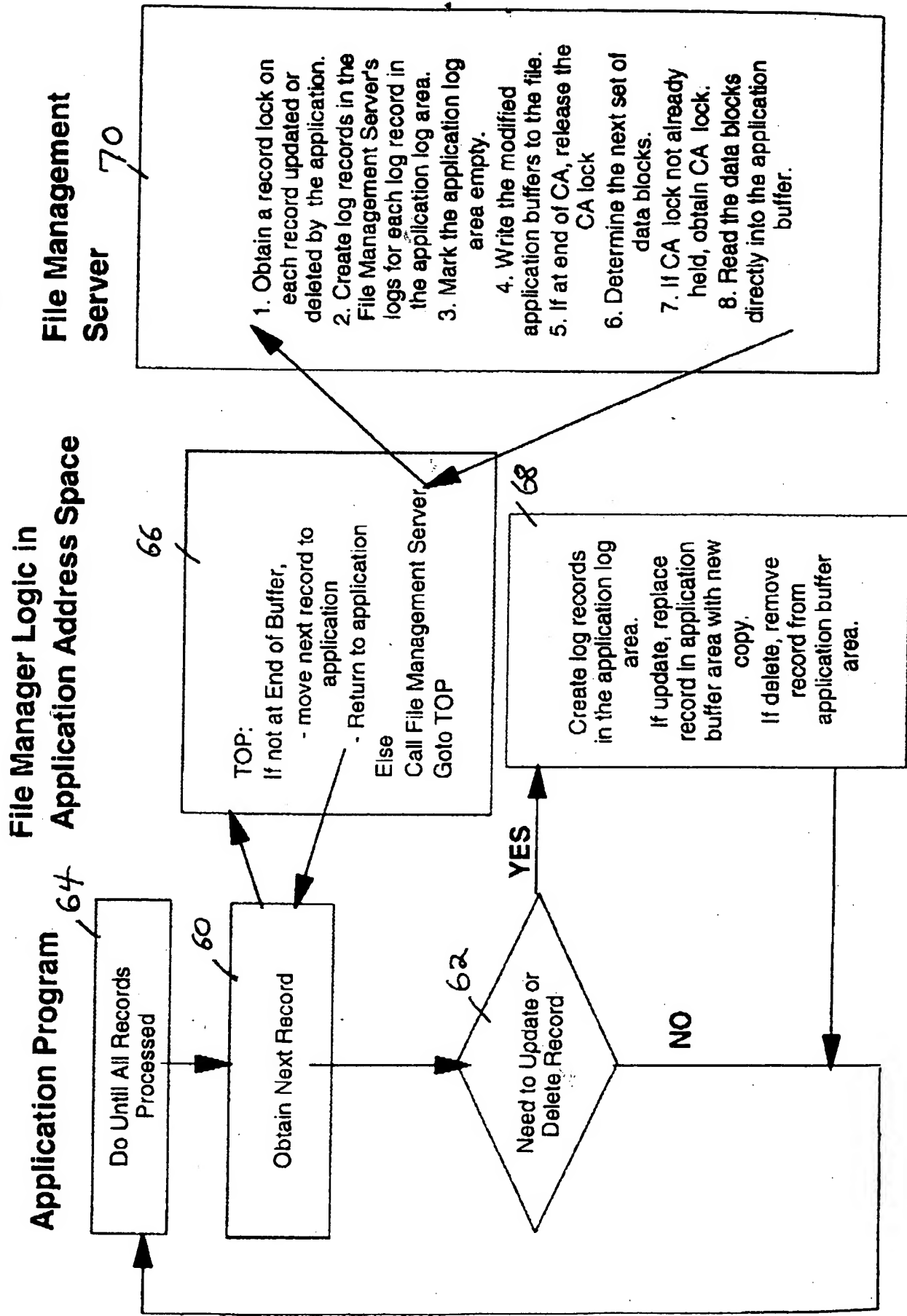
Figure 3.
Batch Sequential Processing Flow

Application Program

File Manager Logic in Application Address Space

File Management Server

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File Management Server

1. Obtain a record lock on each record updated or deleted by the application.
2. Create log records in the File Management Server's logs for each log record in the application log area.
3. Mark the application log area empty.
4. Write the modified application buffers to the file.
5. If at end of CA, release the CA lock
6. Determine the next set of data blocks.
7. If CA lock not already held, obtain CA lock.
8. Read the data blocks directly into the application buffer.

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TOP:
If not at End of Buffer,
- move next record to application
- Return to application

Else
Call File Management Server
Goto TOP

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Create log records in the application log area.

If update, replace record in application buffer area with new copy.

If delete, remove record from application buffer area.

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Do Until All Records Processed

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Obtain Next Record

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Need to Update or Delete Record

YES

NO

Figure 4.

File Management Server Commit, Backout Processing

Commit

Write all file buffers modified by this application to the files

↓

Release all record locks held by this application.

Backout

Use the Undo log to backout all uncommitted file changes made by this application.

↓

Release all record locks held by this application.